Claim Amendments

1. (currently amended) A method of reducing an input image of an original image size (F, N) for providing a reduced image of a target image size (F_n) smaller than the original image size, wherein the input image is formed from a first palette and contains image statistics (L,H) inherent to palette index coefficients indicative of the input image, the first palette having a first palette size with a first number of colors, said method comprising the steps of:

selecting a second palette size smaller than the first palette size; and

color mapping the first palette based on the second palette size for providing a second palette for use in forming the reduced image, the second palette having a second number of colors smaller than the first number of colors by a reduction ratio (R), wherein the reduction ratio is at least partially based on a relationship between the target image size and the original image size..

2. (original) The method of claim 1, wherein the second palette size is selected based on the image statistics of the first palette.

3. (original) The method of claim 2, wherein the image statistics include entropy (H) of the palette index coefficients in the input image.

4. (original) The method of claim 2, wherein the image statistics include entropy (H) and average run length (L) of the palette index coefficients in the input image.

5. (original) The method of claim 1, wherein the input image is provided in a GIF format.

6. (currently amended) A method of reducing an input image of an original image size (F, N) for providing a reduced image of a target image size (F_n) smaller than the original image size, wherein the input image is formed from a first palette and contains image statistics (L,H) inherent to palette index coefficients indicative of the input image, the first palette having a first palette size with a first number of colors, said method comprising the steps of:

selecting a second palette size smaller than the first palette size; and

color mapping the first palette based on the second palette size for providing a second palette for use in forming the reduced image, the second palette having a second number of colors smaller than the first number of colors by a reduction ratio (R), ~~The method of claim 1, further comprising the steps of~~:

obtaining a first statistical size (S_0) of the input image based on the image statistics (L, H) and the original image size (N) of the input image;

computing a second statistical size (S) of the reduced image based on the second palette; and

estimating the image size (S_f) of the reduced image based on the first image size (F), the first statistical size (S_0), the second statistical size (S) and the reduction ratio (R).

7. (original) The method of claim 6, further comprising the steps of

adjusting the second palette size; and

repeating the color mapping, computing and estimating steps until a difference between the estimated image size (S_f) and the target image size (F_n) falls within a predetermined limit.

8. (original) The method of claim 6, wherein the first statistical size (S_0) is computed based on $S = -\sum_i p(i)\log_2 p(i)$, wherein $p(i)$ is the probability of palette index i occurring, equivalent to $p(i) = C_i/N$, C_i being the number of times palette index i occurs in the input image and N being the number of pixels in the input image.

9. (original) The method of claim 6, further comprising the step of providing a scaling factor (ESF) for adjusting the estimated image size (S_f).

10. (original) The method of claim 9, wherein the scaling factor (ESF) is computed based on the reduction ratio (R).

11. (original) The method of claim 10, wherein the scaling factor (ESF) is computed from a logarithmic function of the reduction ratio (R).

12. (original) The method of claim of claim 11, wherein the scaling factor (*ESF*) is computed from

$$ESF = 1 + 0.005 \log_2 R.$$

13. (original) The method of claim 9, wherein the scaling factor (*ESF*) is computed based on the image statistics (*L*) and the reduction ration (*R*).

14. (original) The method of claim 13, wherein the image statistics include average run-length (*L*) of palette index coefficients in the input image.

15. (original) The method of claim 14, wherein the scaling factor (*ESF*) is computed from a logarithmic function of the reduction ration (*R*) and a hyperbolic function of the average run-length of the input image.

16. (original) The method of claim 15, wherein the scaling factor (*ESF*) is computed from

$$ESF = 1 + 0.05 \log_2 R.L\gamma$$

where $L\gamma = 0.3 + \tanh(L - 1)$.

17. (original) The method of claim 9, wherein the scaling factor *ESF* is equal to or slightly less than 1.

18. (currently amended) A device for reducing an input image of an original image size (*F, N*) to provide a reduced image of a target image size (F_n) smaller than the original image size, wherein the input image is formed from a first palette and contains image statistics (*L,H*) inherent to palette index coefficients indicative of the input image, the image statistics providing a first statistical size (S_0), the first palette having a first palette size with a first number of colors, and wherein said image size reduction is based on a selected palette size, said device comprising:

color mapping means, responsive to the selected palette size, for obtaining a second palette and for providing palette information indicative of the second palette, the second palette having a second number of colors smaller than the first number of colors by a reduction ratio (*R*)

for use in forming the reduced image, wherein the reduction ratio is at least partially based on a relationship between the target image size and the original image size.

19. (original) The device of claim 18, wherein the second palette size is selected based on the image statistics of the first palette.

20. (original) The device of claim 19, wherein the image statistics include entropy (*H*) of the palette index coefficients in the input image.

21. (original) The device of claim 19, wherein the image statistics include entropy (*H*) and average run length (*L*) of the palette index coefficients in the input image.

22. (original) The device of claim 18, wherein the input image is provided in a GIF format.

23. (original) The device of claim 18, wherein the first statistical size (S_0) is computed based on $S = -\sum_i p(i) \log_2 p(i)$, wherein $p(i)$ is the probability of palette index i occurring, equivalent to $p(i) = C_i / N$, C_i being the number of times palette index i occurs in the input image and N being the number of pixels in the input image.

24. (currently amended) A device for reducing an input image of an original image size (*F, N*) to provide a reduced image of a target image size (F_n) smaller than the original image size, wherein the input image is formed from a first palette and contains image statistics (*L,H*) inherent to palette index coefficients indicative of the input image, the image statistics providing a first statistical size (S_0), the first palette having a first palette size with a first number of colors, and wherein said image size reduction is based on a selected palette size, said device comprising:

color mapping means, responsive to the selected palette size, for obtaining a second palette and for providing palette information indicative of the second palette, the second palette having a second number of colors smaller than the first number of colors by a reduction ratio (*R*) for use in forming the reduced ~~image The device of claim 18, further comprising:~~

computing means, responsive to the palette information, for providing a second statistical size (S) of the reduced image based on the second palette; and

estimating means, responsive to the second statistical size (S), for providing an estimated image size (S_f) of the reduced image, based on the first image size (F), the reduction ratio (R), the first statistical size (S_0).

25. (original) The device of claim 24, further comprising means for providing a scaling factor (ESF) for adjusting the estimated image size (S_f).

26. (original) The device of claim 25, wherein the scaling factor (ESF) is computed based on the reduction ratio (R).

27. (original) The device of claim 26, wherein the scaling factor (ESF) is computed from a logarithmic function of the reduction ratio (R).

28. (original) The device of claim of claim 27, wherein the scaling factor (ESF) is computed from

$$ESF = 1 + 0.005 \log_2 R.$$

29. (original) The device of claim 25, wherein the scaling factor (ESF) is computed based on the image statistics (L) and the reduction ration (R).

30. (original) The device of claim 29, wherein the image statistics include average run-length (L) of the input image.

31. (original) The device of claim 30, wherein the scaling factor (ESF) is computed from a logarithmic function of the reduction ration (R) and a hyperbolic function of the average run-length of the input image.

32. (original) The device of claim 31, wherein the scaling factor (ESF) is computed from

$$ESF = 1 + 0.05 \log_2 R.L\gamma$$

where $L\gamma = 0.3 + \tanh(L - 1)$.

33. (original) The device of claim 25, wherein the scaling factor *ESF* is substantially equal to 1.

34. (original) The device of claim 25, wherein the scaling factor *ESF* is slightly less than 1.

35. (new) A software product comprising a computer readable medium for use in reducing an input image of an original image size (*F, N*) for providing a reduced image of a target image size (F_n) smaller than the original image size, wherein the input image is formed from a first palette and contains image statistics (*L,H*) inherent to palette index coefficients indicative of the input image, the first palette having a first palette size with a first number of colors, the computer readable medium having executable pseudo-codes embedded therein, and the pseudo-codes, when executed, carry out the steps of:

selecting a second palette size smaller than the first palette size; and

color mapping the first palette based on the second palette size for providing a second palette for use in forming the reduced image, the second palette having a second number of colors smaller than the first number of colors by a reduction ratio (*R*), wherein the reduction ratio is at least partially based on a relationship between the target image size and the original image size.

36. (new) The software product of claim 35, wherein the pseudo-codes further carry out the steps of:

obtaining a first statistical size (S_0) of the input image based on the image statistics (*L, H*) and the original image size (*N*) of the input image;

computing a second statistical size (*S*) of the reduced image based on the second palette; and

estimating the image size (S_f) of the reduced image based on the first image size (*F*), the first statistical size (S_0), the second statistical size (S) and the reduction ratio (*R*).

37. (new) The software product of claim 36, wherein the pseudo-codes further carry out the steps of

adjusting the second palette size; and

repeating the color mapping, computing and estimating steps until a difference between the estimated image size (S_f) and the target image size (F_n) falls within a predetermined limit.

38. (original) The software product of claim 36, wherein the pseudo-codes further carry out the step of providing a scaling factor (*ESF*) for adjusting the estimated image size (S_f), and wherein the scaling factor (*ESF*) is computed based on the image statistics (L) and the reduction ration (R), the image statistics including average run-length (L) of palette index coefficients in the input image, and the scaling factor (*ESF*) is computed from

$$ESF = 1 + 0.05 \log_2 R.L\gamma$$

where $L\gamma = 0.3 + \tanh(L - 1)$.